

STORMWATER WETLAND SIZING WORKSHEET

2005 Surface Water Design Manual Sizing Method

Project name: _____

METHODS OF ANALYSIS (see p. 6-86)

Step 1) Determine volume factor f .

Use basic size $f =$ 3 Consult WQ requirements (Section 1.2.8)

Step 2) Determine rainfall R for mean annual storm.

Rainfall (R) _____ (feet) Required from Figure 6.4.1.A

Step 3) Calculate runoff from mean annual storm

$$V_r = (0.9A_i + 0.25A_{ig} + 0.10A_{tf} + 0.01 A_{og}) \times R$$

$A_i =$	tributary area of impervious surface	_____ (sf)	Determine now
$A_{ig} =$	tributary area of till grass	_____ (sf)	Determine now
$A_{tf} =$	tributary area of till forest	_____ (sf)	Determine now
$A_{og} =$	tributary area of outwash grass	_____ (sf)	Determine now
$R =$	rainfall from mean annual storm	_____ (ft)	From Step 2
$V_r =$	volume of runoff from		
	mean annual storm	_____ (cf)	

Step 4) Calculate volume of "template" wetpool

$$V_b = f V_r$$

$f =$	Volume factor	<u>3</u> (unitless)	From Step 1
$V_r =$	volume runoff, mean annual storm	_____ (cf)	From Step 3
$V_b =$	Volume of the "template" wetpool	<div style="border: 1px solid black; width: 80px; height: 20px;"></div> (cf)	

Step 5) Calculate required wetland surface area

$A_{top} = V_b / 3$	_____	(A_{top} = surface area of both cells)
template $V_b =$	_____ (cf)	From step 4
$A_{top} =$	<div style="border: 1px solid black; width: 80px; height: 20px;"></div> (sf)	"Sizing" depth is 3 ft (see step 7, p. 6-87)

Step 6) Determine wetland cell dimensions

same as steps 7 & 8, stormwater wetland)

a) Determine geometry of first cell

V_r from step 3 = volume 1st cell	_____ (cf)	
Depth h 1st cell (minus sed. stor.)	_____ (ft)	Note actual cell depth may be from 4 to 8 ft

Determine horizontal xs area at mid-depth using $A_{mid} = V1st/h$

A_{mid} _____ (sf)

Mid-width _____ (ft)

Mid-length _____ (ft)

Determine horizontal xs area at surface

$Z =$ Side slope length: ____ (H): 1 (V) _____ (ft) 3:1 recommended

$2(h/2 \times Z) =$ _____ (ft)

Find top dimensions by adjusting for shape geometrics

Top width _____ (ft)

Top length _____ (ft)

$A_{T1} =$ _____ (sf)

b) Determine geometry of second cell

Wetland surface area A_{top} _____ (sf)

From step 5

Surface area of cell 2

$A_{top} - A_{T1}$

Depth h of 2nd cell

varies, 1.5' avg

See Table 6.4.3.A and
Criteria #8 p. 6-88

Step 7) Choose plants for wetland cell

See recommendations in Table 6.4.1.A, p. 6-75

Step 8) Design rest of pond (See p. 6-87 for Criteria))

Internal berm

Inlet & Outlet

Primary overflow

Access

Other Design Details (Sections 6.2.2, p. 6-18, 6.2.3, p. 20 and 6.2.4, p. 6-22)

Sequence of Facilities

Setbacks

Sideslopes, fencing, embankment

Liners

Total pond surface area estimate

Surface area 1st cell + 2nd cell + area for internal berm + area for access ramp

= _____

= _____

= sf

Plus setbacks, access roads, 100-yr conveyance